AMENDMENT UNDER 37 C.F.R. § 1.111

Application No.: 10/562,730

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

- 1. (canceled).
- 2. (original): A fluoroalkylcarboxylic acid derivative which is represented by the general formula (ii):

 $Rf^{I}(OCH_{2}CF_{2}CF_{2})_{n1}OCHX^{I}CF_{2}(Rf^{2})_{n2}COOM$ (ii)

wherein Rf¹ represents a straight or branched fluoroalkyl group containing 1 to 20 carbon atoms, said fluoroalkyl group may optionally contain 1 to 5 oxygen atoms in the principal chain thereof, Rf² represents a straight or branched fluoroalkylene group containing 1 to 25 carbon atoms, said fluoroalkylene group may optionally contain 1 to 5 oxygen atoms in the principal chain thereof, n1 represents an integer of 0 to 3, n2 represents an integer of 0 or 1, X¹ represents hydrogen atom or fluorine atom, and M represents NH₄ or a monovalent metal element.

- 3. (currently amended): The fluoroalkylcarboxylic acid derivative according to Claim 1 Claim 2,
- wherein Rf¹ is a straight or branched fluoroalkyl group containing 1 to 7 carbon atoms, said fluoroalkyl group may optionally contain 1 to 3 oxygen atoms in the principal chain thereof.
- 4. (original): The fluoroalkylcarboxylic acid derivative according to Claim 3, wherein Rf¹ is CF₃-, CF₃CF₂-, CF₃CF₂CF₂-, (CF₃)₂CF-, CF₃CF₂CF₂-, CF₃CF₂CF₂-, CF₃CF₂CF₂- or CF₃CF(CF₃)CF₂-.
- 5. (currently amended): The fluoroalkylcarboxylic acid derivative according to Claim 1 Claim 2,

AMENDMENT UNDER 37 C.F.R. § 1.111 Application No.: 10/562,730

wherein n1 is 0 (zero).

6. (currently amended): The fluoroalkylcarboxylic acid derivative according to Claim 1 Claim 2, wherein Rf² is $-CF_2OCF_2$ -, $-CF_2(OCF(CF_3)CF_2)_{n3}OCF(CF_3)$ - (in which n3 represents an integer of 0 to 4) or $-CF_2(OCF(CF_3)CF_2)_{n4}(CF_2CF_2)_{n5}$ - (in which n4 represents an integer of 0 to 5 and n5 represents an integer of 0 to 5 provided that n4 and n5 satisfy the relation $3 \times n4 + 2 \times n5 \le 10^{-10}$

7. (currently amended): The fluoroalkylcarboxylic acid derivative according to Claim 1 Claim 2,

wherein n2 is 0 (zero).

20).

- 8. (currently amended): A surfactant which comprises the fluoroalkylcarboxylic acid derivative according to Claim 1 Claim 2.
- 9. (withdrawn): A method of producing a fluoropolymer, wherein the fluoroalkylcarboxylic acid derivative according to Claim 1 is used as a surfactant in carrying out a polymerization in an aqueous medium.
- 10. (withdrawn): The method of producing the fluoropolymer according to Claim 9, wherein the fluoroalkylcarboxylic acid derivative is used in an amount of 0.0001 to 20% by mass relative to the aqueous medium.
- 11. (withdrawn): A fluoropolymer aqueous dispersion,
 wherein a particle comprising a fluoropolymer is dispersed in an aqueous medium in the
 presence of the fluoroalkylcarboxylic acid derivative according to Claim 1.
- 12. (withdrawn): A fluoropolymer powder which is obtained by coagulating the fluoropolymer aqueous dispersion according to Claim 11.

AMENDMENT UNDER 37 C.F.R. § 1.111

Application No.: 10/562,730

13. (withdrawn): A fluoropolymer aggregate obtained by coagulating the fluoropolymer aqueous dispersion according to Claim 11, which is a polytetrafluoroethylene powder, a powder or a pellet each comprising a melt-processible resin, or a coagulation comprising an elastomeric polymer.

- 14. (withdrawn): A film/membrane which is obtained by coating, impregnation or cast film formation using the fluoropolymer aqueous dispersion according to Claim 11.
- 15. (withdrawn): A molded article which is obtained by molding using the fluoropolymer powder according to Claim 12.
- 16. (withdrawn): A method of producing a fluoroalkylcarboxylic acid derivative, which comprises producing the fluoroalkylcarboxylic acid derivative according to Claim 1 by converting a fluorocarboxylic acid fluoride represented by the general formula (3): $Rf^{I}(OCH_{2}CF_{2}CF_{2})_{nI}OCX^{I}X^{2}CF_{2}(Rf^{2})_{n2}COF \qquad (3)$ wherein Rf^{I} , Rf^{2} , n1, n2, X^{I} and X^{2} are as defined hereinabove, to a fluorocarboxylic acid salt.
- 17. (withdrawn): The method of producing the fluoroalkylcarboxylic acid derivative according to Claim 16,
 wherein the conversion of the fluorocarboxylic acid fluoride represented by the general formula

 (3) to the fluorocarboxylic acid salt is carried out by
- (A) a method comprising converting the terminal --COF group in said general formula (3) to --COOH by hydrolysis using an acid and converting the -COOH to --COOM by neutralization with an alkali,
- (B) a method comprising esterifying the terminal -COF group in said general formula (3) and, after separation of the ester, converting the ester moiety to -COOM by saponification, or

AMENDMENT UNDER 37 C.F.R. § 1.111

Application No.: 10/562,730

(C) a method comprising esterifying the terminal –COF group in said general formula (3) and, after separation of the ester, converting the ester moiety to –COOM by saponification, then converting the latter to –COOH using an acid and then converting this to –COOM by neutralization with an alkali.

18. (withdrawn): The method of producing the fluoroalkylcarboxylic acid derivative according to Claim 16,

wherein the fluorocarboxylic acid fluoride represented by the general formula (3) is represented by said general formula (3) in which n2 is 1, and

said fluorocarboxylic acid fluoride represented by the general formula (3) is produced by reacting an intermediate fluorocarboxylic acid fluoride represented by the general formula (2):

 $Rf^{1}(OCH_{2}CF_{2}CF_{2})_{n1}OCX^{1}X^{2}CF_{2}COF$ (2)

wherein Rf¹, n1, X¹ and X² are as defined above, with tetrafluoroethylene and iodine in an aprotic polar solvent to thereby convert the terminal –COF in said general formula (2) to -CF₂OCF₂CF₂I, followed by further conversion of the latter to -CF₂OCF₂COF by reaction with oleum, or

said fluorocarboxylic acid fluoride represented by the general formula (3) is produced by converting the terminal –COF in said general formula (2) to

-CF₂(OCF(CF₃)CF₂)_pOCF(CF₃)COF [p being an integer of 0 to 5] by addition of hexafluoropropylene oxide, converting the terminal –CF(CF₃)COF to –CF(CF₃)I via – CF(CF₃)COI and converting –CF(CF₃)I to –CF(CF₃)(CF₂CF₂)_qI (q being an integer of 1 to 5), followed by further conversion to

 $-CF(CF_3)(CF_2CF_2)_{q-1}CF_2COF.$

AMENDMENT UNDER 37 C.F.R. § 1.111

Application No.: 10/562,730

Attorney Docket No.: Q91785

19. (withdrawn): The method of producing the fluoroalkylcarboxylic acid derivative

according to Claim 16,

wherein the intermediate fluorocarboxylic acid fluoride represented by the general formula (2) is

a second intermediate represented by the general formula (2a):

 $Rf^{l}(OCH_{2}CF_{2}CF_{2})_{n1}OCHFCF_{2}COF$ (2a)

wherein Rf¹ and n1 are as defined above, as obtained by monofluorinating a first intermediate

represented by the general formula (1):

 $Rf^{l}(OCH_{2}CF_{2}CF_{2})_{n1}OCH_{2}CF_{2}COF$ (1)

wherein Rf1 and n1 are as defined above, or

a third intermediate represented by the general formula (2b):

 $Rf^{l}(OCH_{2}CF_{2}CF_{2})_{nl}OCF_{2}CF_{2}COF$ (2b)

wherein Rf¹ and n1 are as defined above, as obtained by difluorinating said first intermediate.

20. (withdrawn): The method of producing the fluoroalkylcarboxylic acid derivative

according to Claim 16, wherein Rf¹ represents a straight or branched fluoroalkyl group

containing 5 to 7 carbon atoms,

said fluoroalkyl group may contain 1 to 5 oxygen atoms in the principal chain thereof.